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New *Calbovista, Mycena, Rhizopogon, Stictis,* and *Symphyosirinia* records from Turkey

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Abstract—*Calbovista subsculpta*, *Mycena pearsoniana*, *Rhizopogon rocabrunae*, *Stictis radiata*, and *Symphyosirinia angelicae* were identified amongst macrofungal samples collected from natural habitats in Tokat and Samsun provinces between 2012 and 2015. These species are recorded for the first time from Turkey.

Key words—ascomycetes, basidiomycetes, macrofungi, taxonomy

Introduction

Checklists of larger fungi recorded in Turkey have been published by Sesli & Denchev (2014) and Solak et al. (2015) with new records added to the Turkish mycota reported in other papers (Akata et al. 2014; Akata & Doğan 2015, Doğan & Öztürk 2015, Güngör et al. 2015, Kaya & Uzun 2015, Kaya 2015, Sesli et al. 2015, Sesli & Moreau 2015, Türkoğlu et al. 2015, Uzun et al. 2015).

Field studies were conducted during 2012–2015 in Tokat province (Canpolat Plateau; Baydarlı Village) and Samsun province (Ladik district) in the inland Middle Black Sea Region of Turkey. The Canpolat Plateau (alt. c. 1300 m) is a rugged semi-arid highland area with mixed forests dominated by *Quercus pubescens* and *Carpinus orientalis*. The Baydarlı village area (alt. c. 1500 m) also has mixed forests dominated by *Quercus pubescens* but a drier climate. The Ladik district (alt. c. 1400 m) is a highland area with mixed forests dominated by *Pinus nigra*.

Sesli & Denchev (2008) have attributed the high mushroom diversity to this region to its ecological characteristics, climate, and high ambient humidity. The aim of this study was to explore the diversity of mushrooms in the area and add to the knowledge of the Turkish mycota.

We describe and illustrate below our collections representing species reported for the first time from Turkey: *Calbovista subsculpta* (*Agaricaceae*), *Mycena pearsoniana* (*Mycenaceae*), *Rhizopogon rocabrunae* (*Rhizopogonaceae*), *Stictis radiata* (*Stictidaceae*), and *Symphyosirinia angelicae* (*Helotiaceae*).

Materials & methods

Macrofungi were collected from Canpolat and Baydarlı (Tokat), and Ladik (Samsun) areas between 2012 and 2015. The habitat and morphological characteristics of the macrofungal specimens were recorded and photographed with a Canon EOS 600 D digital camera equipped with a macro lens. The collections were examined microscopically at Gaziosmanpaşa University according to Clémençon (2009). The specimens were sectioned with a new razor blade under a Nikon Optiphot-2 microscope; sections were mounted in diluted ammonia, stained with Melzer's reagent, Congo red, or Cotton blue, and examined under a Nikon trinocular microscope. Species were identified after consultation with the literature (Phillips 1981; Moser 1983; Bon 1987; Breitenbach & Kränzlin 1984, 1991, 2000; Ellis & Ellis 1990; Jordan 2004; Knudsen & Vesterholt 2008). All samples were stored in the Fungarium of Department of Biology, Gaziosmanpaşa University, Tokat, Turkey (FGOU).

Taxonomy

Calbovista subsculpta Morse ex M.T. Seidl, Mycotaxon 54: 390 (1995) Fig. 1

Fruit body 70–140 mm broad, ≤80–90 mm high; plicate and contracted toward a rooting base, globose to pear shaped. Exoperidium whitish yellow to cream when young, the color then turns to yellow with the appearance of white patches in yellow through maturation, 5.5–7.5 mm high, breaking up into pyramidal warts or plates separated by parallel transverse lines; small truncated pyramids leathery, broken into irregular 1.5–3.5 mm patches, short brownish hairs found in the pyramid centers. Endoperidium white to cream when young, then yellow to orange, and finally dark brown in age. Gleba white to cream, becoming ochre to olivaceus, finally brown. Basidiospores 3.5–5 µm diam. (occasionally ovate), hyaline, most with a central oil-droplet.

Specimen examined: **TURKEY, Tokat,** Baydarlı village, 40°57′09″N 37°29′50″E, 1632 m, single to gregarious in subalpine open areas near forest edge, 28 April 2013, leg. I. Türkekul (FGOU 3927).

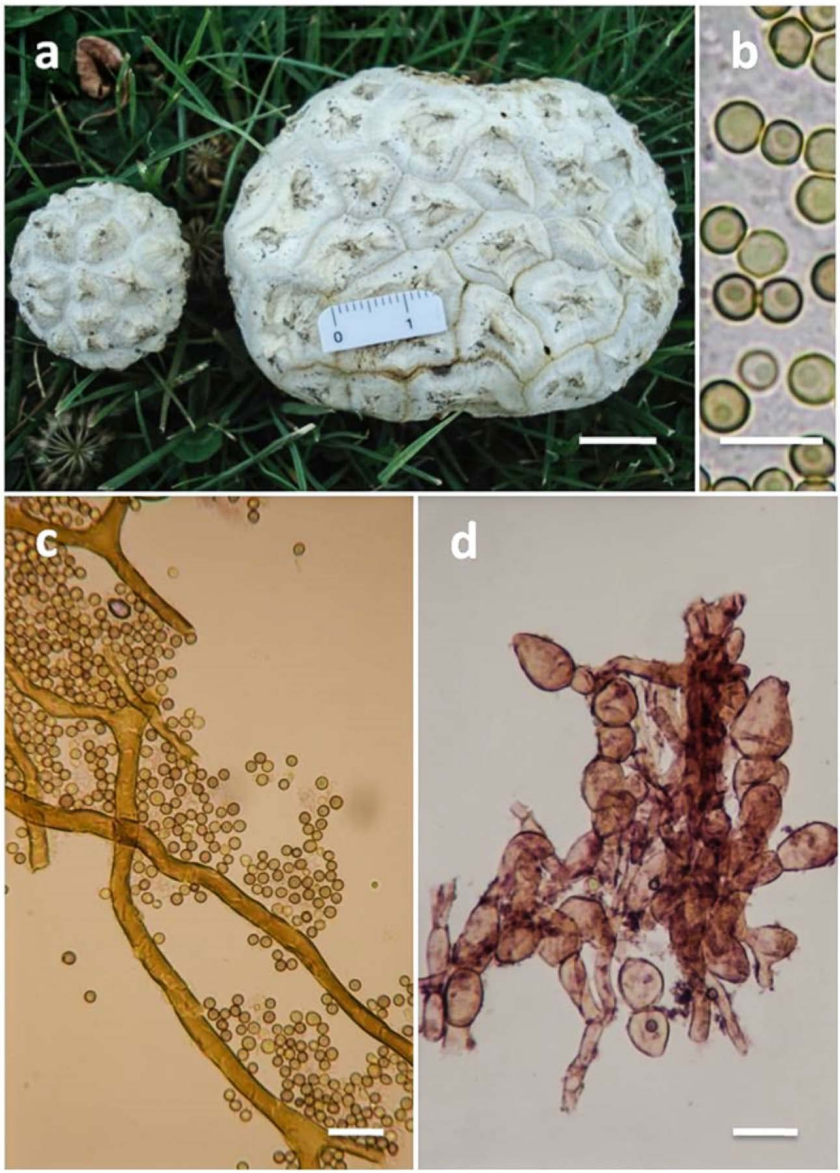

Fig. 1. *Calbovista subsculpta*: a. basidiomata; b. basidiospores; c. basidiospores and capillitial threads; d. pileipellis. Scale bars: a = 10 mm; b = 10 µm; c, d = 20 µm.

Comments—The genus *Calbovista,* which comprises only three species, has not previously been recorded from Turkey, thus making our report of *C. subsculpta* a new record for the country at both the specific and generic levels. It is diagnosed by the presence of nested pyramids on the cap, with the outer pyramid taller and the inner ones shorter, irregular shaped, truncate, and leathery. Generally found above 900 m elevation, occasionally in alpine areas of disintegrated rock and soil mix (Ramsey 2003). Our samples were also collected in alpine areas at 1632 m.

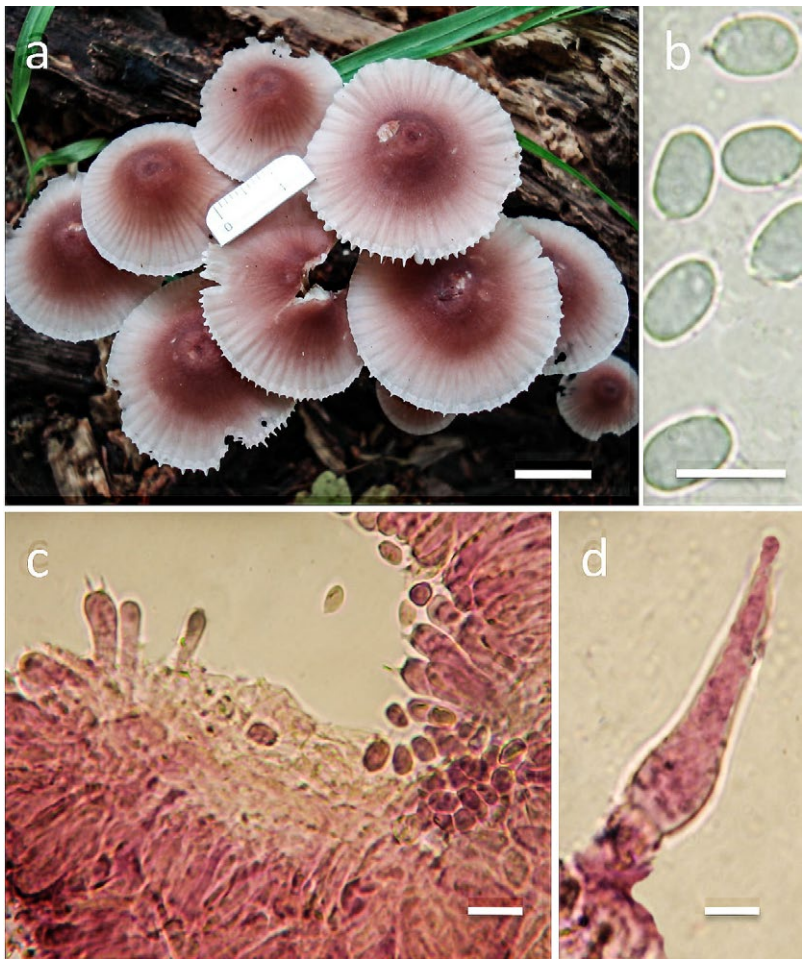

Fig. 2. *Mycena pearsoniana*: a. basidiomata; b. basidiospores. c. basidia; d. cheliocystidia. Scale bars: a = 10 mm; b–d = 10 µm.

Mycena pearsoniana Dennis ex Singer, Sydowia 12: 233 (1959) Fig. 2

Pileus 10–30 mm across, convex, flattening with age, becoming plano-convex, violet pinkish tints, paler at margin. Stipe 30–55(–75) × 1.5–3 mm, cylindrical or slightly enlarged toward base, smooth, moist, villose at base, cinnamon at apex, fragile to firm, Taste mild or rancid, smell raphanoid. Lamellae close, narrow, adnate, whitish flushed violet. Pleurocystidia absent. Cheilocystidia 35–65 × 7–13 µm, cylindric with rounded apex, smooth. Spore print white. Basidia 25–30 × 5–7 µm, clavate to cylindric. Basidiospores 6–8 × 3.5–5 µm, inamyloid, pip-shaped.

Specimen examined: **TURKEY, Tokat,** Canpolat village, 40°33′55″N 36°36′48″E, 1245 m, on a rotten stump of *Picea orientalis*, 12 November 2012, leg. I. Türkekul (FGOU 3862).

Comments—*Mycena* is represented by 2186 species worldwide (www.indexfungorum.org; 15 December 2016) and 60 species in Turkey (Sesli & Denchev 2008). *Mycena pearsoniana* can be diagnosed by its 35–65 × 7–13 µm cylindrical cheilocystidia and pale blue to purplish pink pileus.

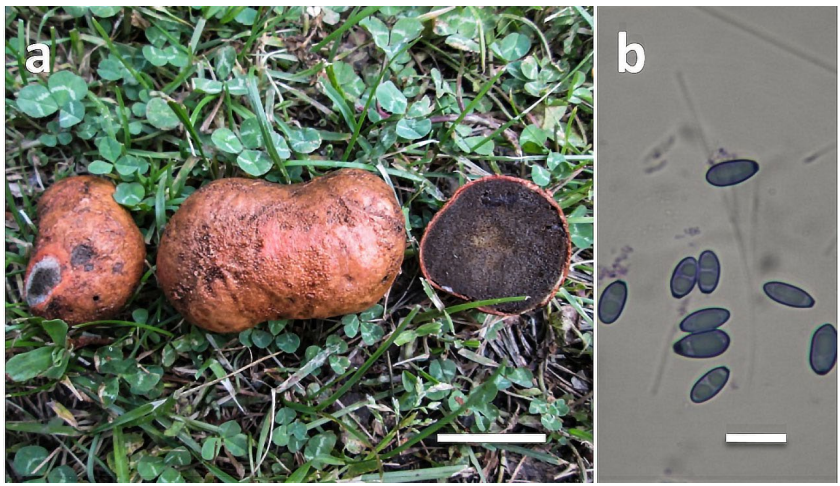

Fig. 3. *Rhizopogon rocabrunae*: a. basidiomata; b. basidiospores. Scale bars: a = 20 mm; b = 10 µm.

Rhizopogon rocabrunae M.P. Martín, Edic. Espec. Soc. Catalana Micol. 5: 95 (1996) Fig. 3 (a,b & c,d)

Fruit body 2–5 cm across, irregularly potato-shaped, ovate to globose, brown with reddish orange squamulose peridium, roughly sub-spherical, covered with brownish mycelial threads. The fruit body can be fully

Fig. 3. *Rhizopogon rocabrunae*: c. elements of pileipellis; d. basidia and glebal element. Scale bars: c = 20 µm; d = 10 µm.

embedded in the soil or somewhat extending upwards. Gleba olivaceous at maturity, quite solid and durable. Taste and smell not distinctive. Basidia 13–15 × 5–9 µm, clavate to cylindric, 4–spored, with basal clamp connection. Basidiospores 6.5–9(–10) × 2.5–3.5 µm, truncate, smooth, elongate, and some have two oil droplets.

Specimen examined: **TURKEY, Tokat,** Canpolat village, 40°33′55″N 36°36′48″E, 1245 m, solitary or gregarious a layer of *Abies alba* needles, 6 November 2013, leg. I. Türkekul (FGOU 4115).

Comments—*Rhizopogon rocabrunae* is an ectomycorrhizal species primarily associated with *Abies alba*. Its most remarkable features are a reddish orange squamulose peridium and elongated basidiospores clearly truncated at the base.

Stictis radiata (L.) Pers., Observ. Mycol. 2: 73 (1800) Fig. 4

Apothecia 4–8 mm, irregularly rounded, hymenium entirely embedded in the wood, yolk-yellow to bright orange-red, margin whitish, erect, short, and irregular, bulging upward and splitting into lobes. Hymenium variably pale orange to yellow or white. The base of the hymenium turns blue in iodine. Asci 150–220(–250) × 8–10 µm, cylindric. Ascospores 140–210 × 2–2.5 µm, smooth, filiform, hyaline. Paraphyses 150–190 × 1.5–2 µm, fibrous, numerous and very slender, and sometimes branched at the top.

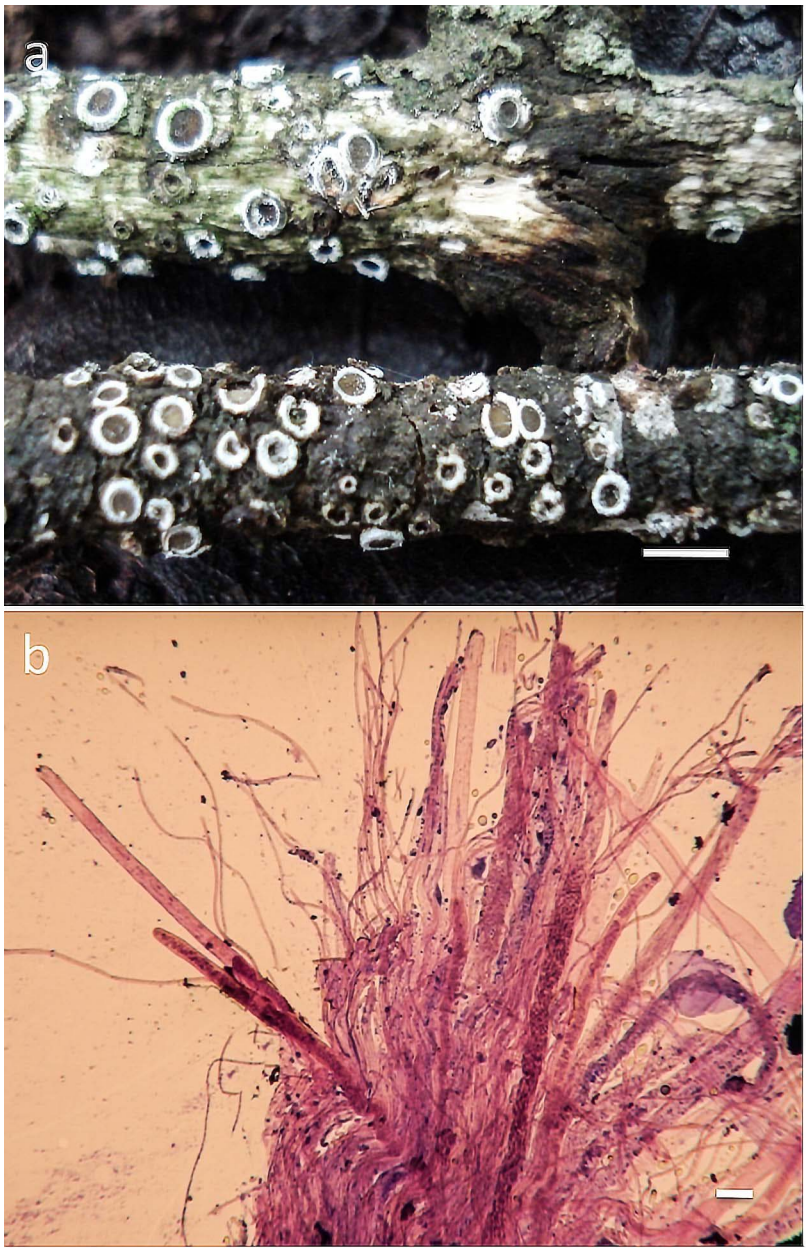

Fig. 4. *Stictis radiata*: a. apothecia; b. asci and paraphyses.
Scale bars: a = 10 mm; b = 20 μm.

Specimen examined: **TURKEY**, **Samsun,** Ladik village, 41°05′17″N 36°05′17″E, 734 m, on the decaying branches of deciduous trees, 9 September 2015, leg. I. Türkekul (FGOU 4974).

Comments—*Stictis radiata* is a new genus for Turkey (Sesli & Denchev 2008). Breitenbach & Kränzlin (1984) stated that it was found on many substrates, wood, herbaceous stems, fern rachises, and including decaying leaves. We collected our samples from decaying branches of deciduous trees. Macroscopically, it is very similar to *S. stellata,* which can be distinguished by a hymenium that does not turn blue in iodine.

Symphyosirinia angelicae E.A. Ellis,
Trans. Norfolk Norw. Nat. Soc. 18(3): 11 (1956) Fig. 5

Apothecia 6–10 mm diam., stalked, pale, light cream turning gray when dried. Hymenium pale ocher white, light cream, smooth, slightly concave. Stipe 18–25 × 0.2–0.4 mm, tubular, tapered at the top. Asci 80–110(–120) × 8–10 (–12) µm, cylindric, inoperculate, with an arched apex becoming sub-truncate when mature. Ascospores 14–17 × 5–6 µm, asymmetrically fusi-lageniform, slipper formed with one end pointed and the other rounded. Paraphyses 45–120 × 3–4 µm, cylindrical, smooth.

Specimen examined: **TURKEY**, **Samsun,** Ladik village, 40°57′07″N 35°53′36″E, 1020 m, on an infected *Heracleum* seed buried under litter or soil, 24 September 2015, leg. I. Türkekul (FGOU 4992).

Comments—*Symphyosirinia angelicae* is a mycorrhizal species found primarily on *Heracleum* seeds (Garcia & Moreau 2002). The stipe length varies according to the depth of the host seed under the soil.

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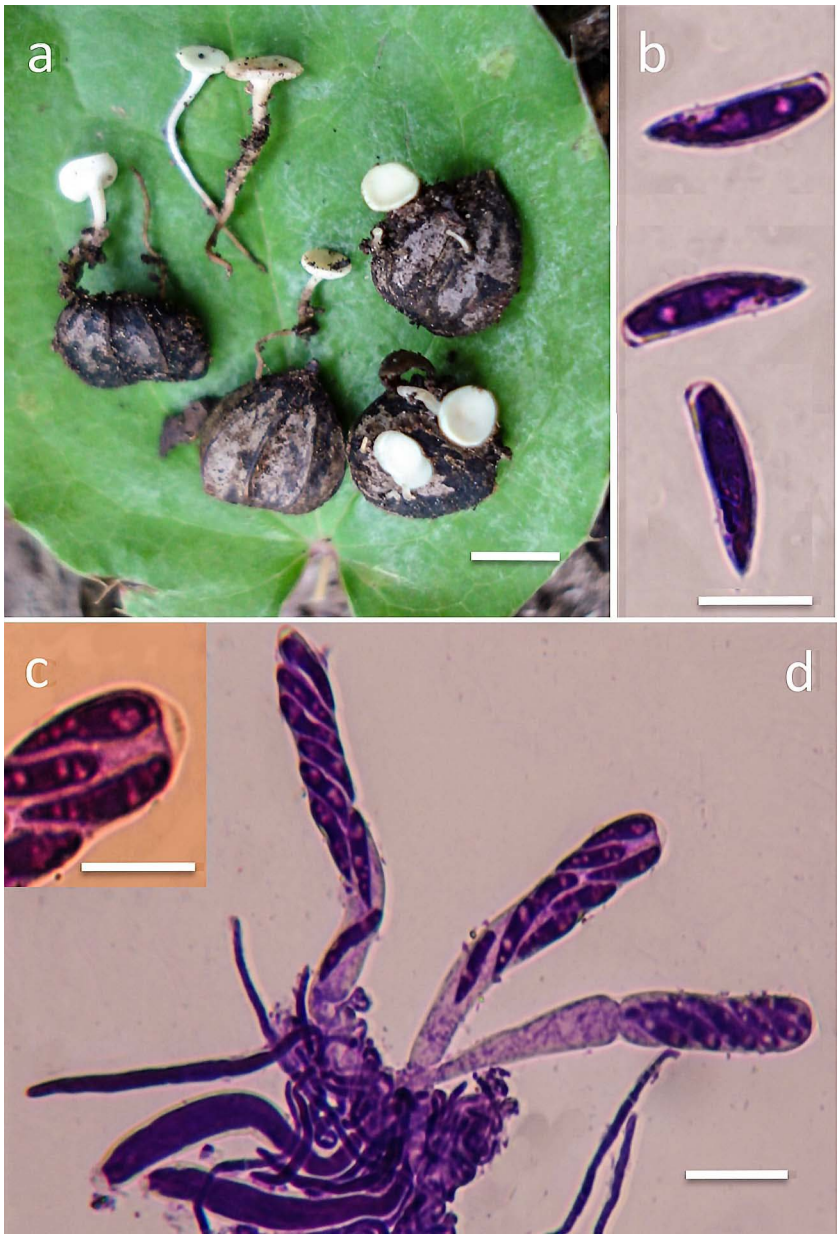

Fig. 5. *Symphyosirinia angelicae:* a. apothecia; b. ascospores;
c. amyloid apex of asci; d. asci and paraphyses. Scale bars: a = 10 mm; b, c = 10 µm; d = 20 µm.

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